

DER Report For NYSRC Executive Committee Meeting 9/11/20

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The September edition of the Distributed Energy Resources (DER) Report is focused two significant presentations that were given at the August 26th Meeting of the New York State Interconnection Technical Working Group ([ITWG](#)):

EPRI	IEEE 1547 – 2018 Impacts / Implementation
Joint Utilities	Smart Inverters Strategic Initiative – Status Update

EPRI's high-level presentation looks at the overall implications of the IEEE 1547-2018 Standard, focusing on technical aspects, new requirements, and impacts on stakeholders. The Joint Utilities presentation creates a proposed framework for implementation of the standard in New York State, anticipating local impacts and concerns.

EPRI Presentation: IEEE 1547 – 2018: Impacts / Implementation ([Link](#))

This presentation begins by identifying the 4 major categories of stakeholders along with their roles in the integration process, including opportunities and challenges: Regulators, Utilities, Developers and Testing / Consultants. Key areas of interest and responsibility are identified for each group.

A timeline for the rollout process shows history, and anticipated stages of revision, voting, certification, and eventual enforcement of the standard in the early months of 2022. The key takeaway is that with little more than a year to go before the enforcement period could begin, efforts should be made now to address potential issues of DER growth, impact on bulk system reliability, and inverter compliance.

The presentation highlighted the evolution in Capability, Testing, and Verification requirements. The major changes associated with the latest version of 1547-2018 include:

1. New voltage/reactive and active power exchange features (Previously unity power factor was standard.)
2. Mandatory Frequency Response (Previously there were none)
3. New Mandatory ride-through requirements for voltage and frequency, ROCOF, voltage phase jumps
4. Mandatory communications capability requirements based on three acceptable standardized protocols
5. New requirements for equipment certifications of DERs and some DER facility / systems

Examples of other RTO / ISO Guidelines that have been developed for Distribution Interconnection Coordination were provided for [Massachusetts Technical Standards Review Group](#), [PJM](#), and [MISO](#). The NERC [Reliability Guideline](#) for BPS Reliability Perspectives on the Adoption of IEEE 1547-2018 (March, 2020) was also referenced.

A [Link](#) was provided for the IEEE Standards Coordinating Committee for 1547-2018, which provides extensive information on the details and development of the standard.

Joint Utilities: Smart Inverters Strategic Initiative – Status Update ([Link to file on NY DPS website](#))

This comprehensive presentation outlined JU's recommendations for DER integration, including a staged approach for building up 15 key functionalities, ordered by increasing complexity and spanning the next 5 years. Implementation starts with autonomous functions, and continues with monitoring, relay coordination, communications and finally a DERMS-like platform for interactive functions. The report discusses the importance of coordinating with IEEE 1547 as an evolving set of requirements, and stresses the importance of getting all the stakeholders and regulatory oversight on board through communications and inclusion (such as this ITWG meeting). A review of development efforts to date and recommendations for next steps are also included. Based on its high relevance and focus, some of information from the presentation has been reproduced below:

Proposed Multi-phase Approach

- **Phase 1: High Priority Autonomous Functions and Planning** - Spans the remainder of 2020 into 2021 and will overlap portions of the Phase 2 effort. Recommendations on default settings of non-communicating functions are expected to be released in June 2021.

Note: IEEE has provided [guidance](#) that there is an ongoing effort for harmonization of IEEE 1547.1-2020 and the yet-to-be-released UL1741-SB. Depending upon the resulting timetable, requirements, and final certification availabilities, this may influence the Phase 1 final milestone release of requirements.

- **Phase 2: Uni-Directional Communications for Monitoring and Back Office Enablement** - Comprehensive activities involving communications, cybersecurity, and back-office systems for establishing a “monitoring-only” regime and are initiated in 2021, with an expectation to last into early 2023.
- **Phase 3: Bulk Electric System Setpoint Requirements** - Focus is harmonization of trip settings with NYISO and NPCC requirements. Discussions have already started, will ramp up during the latter portion of Phase 2 activities in early 2023, and concludes mid-year 2024.
- **Phase 4: Interactive Capabilities and Implementation of “DERMS-like” Capabilities** - Expands upon the autonomous function set to now incorporate interactive capabilities as well as to add additional advanced functions. This phase starts in 2024 and recommendations on default settings could potentially be released in 2025, or when individual utilities have implemented the required DER back-office functionality. This phase requires bi-directional communication capabilities and possibly a DERMS platform.

Consolidation of Phased development of Function Requirements and their Corresponding Primary Use Cases:

Q2 2021	Phase 1: Autonomous Function Reqs	Primary Use Case
1	Anti-Islanding	Ensure safety of personnel and interconnected equipment
2	Fixed Power Factor	Ensure regulatory compliance within operational voltages
3	Reconnect on Restoration	Ensures autonomous restoration
4	Volt-Watt Curve	Ensure regulatory compliance within operational voltages
5	Ramping	Enable gradual ramping to avoid voltage/flicker violations
6	Volt-VAR Curve	Ensure regulatory compliance within operational voltages
Q1 2023	Phase 2: Advanced/Interactive Function Reqs	Primary Use Case
7	Monitor Key DER Data	Improved visibility of operating assets Integrated low cost monitoring and control alternative
Q2 2024	Phase 3: Autonomous Function Reqs	Primary Use Case
8	Frequency-Watt Curve	Ensure regulatory compliance within operational frequency ranges
9	Low Voltage / High Voltage Ride Through	Ensure stability in EPS
10	Low Frequency / High Frequency Ride-Through	Ensure stability in area EPS
Q2 2025	Phase 4: Advanced/Interactive Function Reqs	Primary Use Case
11	Limit Maximum Active Power Mode	Curtailed operations
12	Set Active Power Mode	Explicit control of the real power
13	Scheduling Power Values and Modes	Scheduled participation of the asset in multiple operational use cases
14	DER Disconnect and Reconnect	Direct control of the asset Greater ability to perform restoration operations
15	Dynamic Reactive Support	Voltage stabilization

Key Learnings:

- It is important to clearly communicate readiness to implement SI functionality to regulatory bodies, as the effort is complex and multi-faceted.
- Alignment of the JU with IEEE 1547-2018 signifies that functions that are identified and released in early phases will be mandatory requirements to interconnect.
- With the release of IEEE 1547-2018, a focused effort to understand the implications of Autonomous and Advanced/Interactive Function settings, and communication protocols should be undertaken. The JU believes that this will take at least one year to implement, providing sufficient time for inverter manufacturers to test/certify to IEEE 1547-2018.
- A policy that is harmonized with what exists in other states, specifically in context of nationally recognized testing requirements and certifications, may facilitate ease of compliance for manufacturers.